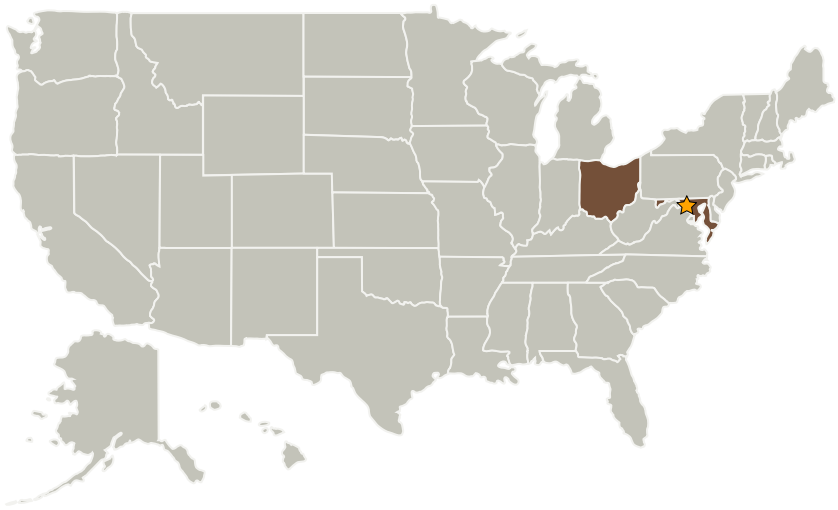
Deep Ultraviolet Macroporous Silicon Filters, Phase I

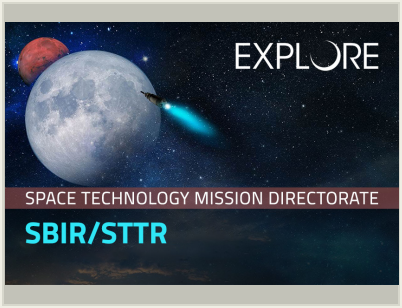
Completed Technology Project (2005 - 2005)

Project Introduction

This SBIR Phase I proposal describes a novel method to make deep and far UV optical filters from macroporous silicon. This type of filter consists of an array of parallel, independent leaky waveguides made in the form of a free-standing, two-dimensionally ordered silicon structure with pore walls coated by a dielectric multilayer. The proposed filters offer unmatched levels of rejection within a very wide rejection band combined with a high level of transmission within the pass band that can be centered throughout the deep and far UV range. In addition, unlike common interference-based filters, the spectral position of the pass and rejection bands will not depend on the angle of incidence. The proposed filters will be light weight and may be manufactured cost-effectively in large quantities. In Phase I, it is proposed to demonstrate the feasibility of the method by fabricating pore structures with different pore wall coatings and measuring the transmission and other optical properties. In Phase II, optimized filters will be fabricated and their properties compared with design predictions. Phase III will involve product design, fabricating filter structures to meet customers' physical as well as optical needs, and marketing and sales investments.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Lake Shore Cryotronics, Inc.	Supporting Organization	Industry	Westerville, Ohio

Primary U.S. Work Locations	
Maryland	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Vladimir Kochergin

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes